

Authentic Learning and ICT

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Changing views of learning

Learning a trade or profession cannot be learned without practical experience and training. That has been known in (vocational) education for ages. The common wisdom, however, was that one needed an extensive theoretical introduction and knowledge base before one could go to practice. Moreover, it was mostly explicit learning that dominated learning, even in practical training.

Nowadays, however, both of these ideas have less adherents. Learning in relatively complex and rich practical environments should be introduced as soon as possible and large parts of learning is implicit learning, where there are no clear learning goals beforehand and where the learning strategy emerges unconsciously in the context of work practice. The possible outcomes of learning cannot be foreseen and will sometime remain totally invisible. Moreover, learning is much more seen as a social process of enculturation in a work practice.

The difference between the old and the new way of thinking can be described in terms of two metaphors: the acquisition metaphor and the participation metaphor.

According to Bruner (1996) the basic assumptions of this metaphor are that

- a) knowledge of the world is treated as the objective truth that can be transmitted from one person to another;
- b) a medium, such as a teacher or a book is needed to transport the knowledge of the one person who “knows” to an other person who does not;
- c) learning has to be institutionalised in a building (school).

The alternative assumptions of social-constructivism and social learning theory (Wenger, 1998), called the participation model (Sfard, 1998), assumes that:

- 1. there is no objective truth and knowledge is constructed in social-interactions between people;
- 2. learning should be done by people themselves; at most they can be helped with this; we cannot do it for them;
- 3. learning is gradually becoming a member of a community of practice (or a culture, or a profession, or a field of science); this happens for an important part outside of institutions and tacit knowledge and skills play important roles in it.

The consequences of the participation metaphor are a) that knowledge cannot always be distributed; b) that knowledge distribution is knowledge (re)creation; c) that knowledge distribution cannot take place outside real interactions between people. This means that organising knowledge distribution is organising interactions between perspectives of (groups) of people. Moreover, knowledge distribution is organising knowledge (re)creation. Exploration and communication become more important processes than information transmission.

This has important consequences for (vocational) education, for instance:

1. focus on other contents (not the known facts but the development of new ideas in a domain; where are the uncertainties and the developments);
2. focus on exchanges of perspectives and social interactions;
3. revaluation of implicit knowledge and skills;
4. more self-directed learning;
5. preparing people for life long learning;
6. learning in communities of practice or learning communities;
7. learning outside institutions and buildings;
8. learning in relation to real authentic problems.

The changes in conceptions about learning metaphors co-occur with a change in the value of certain kinds of knowledge: from explicit knowledge and skills towards implicit knowledge and skills. Whereas in earlier days the focus (especially in educational contexts) was on explicit knowledge and skills, nowadays implicit knowledge and skills have come back to the front of the stage. More and more theorists plead for a revaluation of knowledge and skills of which people are relatively unaware. These kinds of implicit knowledge and skills are probably learned in social practice and thus related to the participation metaphor.

Why is authenticity important?

Authenticity of (and in) learning environments is not only important because of the new recognition of implicit learning (certain things can only be learned in practice), and because of the recognition of the social nature of learning (learning is the process of social enculturation), but also because of motivational reasons. One aspect is that learners feel more engaged and can follow their curiosity and their own interest when learning authentically. The recent research based positive psychology movement (Deci and Ryan, 2000; see also <http://www.psych.rochester.edu/SDT/>) emphasizes three basic needs of humans: autonomy (feeling of some sort of control), competence (feeling of contributing with one's knowledge and skills) and relatedness (feeling of being connected to some other people). Authenticity contributes to autonomy because people can be in control. It strengthens the feeling of competence because people can contribute to something that is important for them. And authenticity contributes to relatedness because authentic learning is social learning, most of the time.

What makes learning authentic? In my view (see also Kearsley and Shneiderman, 1998) there are three main ways to make learning authentic: through relations with other people (relating), through certain kinds of activities (creating) and through real audiences (extending the audience). These three fit quite well in the positive psychology basics: relating and extending the audience are similar to relatedness and creating relates to competence and autonomy

How can one create authenticity through ICT?

How can ICT contribute to relating, creating and extending the audience?

1) Relating

Through ICT learners can be in contact with all kinds of other people in (other) organisations, companies, museums, other schools, other countries, etc. Moreover, ICT can have important roles in the organisation of collaborative learning, both inside learning environments (less noise; better structure) and outside learning environments (with learners in other learning environments, international collaboration, learning communities). One important Dutch guru (Geurts, 2003) especially promotes a change from passive, receptive, little participative work places towards learning working communities, with authentic participation of learners strongly supported by an electronic support system. Electronic discussion forums offer new possibilities for the exchange of ideas. Although it is by no means easy to interact virtually (because one misses important non-verbal and personal information) it can become an important new way of interacting that supplants (instead of replacing) other forms of discussion. New forms of peer-assessment and peer-feedback become possible through ICT.

One particularly important development is computer (CSCL) supported collaborative learning. CSCL is important because learners learn to construct new products, to build knowledge together (Bereiter, 2002). In this way they learn to be part of innovation and research.

2) Creating

Five ways to create knowledge can be organised with the help of ICT: learning through problem solving; learning through decision making, learning through inquiry and research, learning through design activities and learning as meaning construction. All five ways gives the learner a more active role.

In solving problems, learners search for the best (or the only) solution for a problem. In decision-making there is no best answer. It is more a matter of opinion. Advice should be formulated and legitimised. In inquiry or research activities, learners try to answer questions and to test hypotheses. In design activities the task is to make a (new) product that fulfils certain criteria, for instance a website, a poster or a manual. Meaning construction pertains to critical reflection about central concepts and principles. Through discussion learners construct new (collective) meaning.

Hakkarainen (1998) proposed a model that is a good example of “creation”: the progressive inquiry model. It simulates the way knowledge is created in scientific communities. Progressive inquiry engages members of the community in a step-by-step process of question- and explanation driven inquiry. An important distinction (or addition) with other problem solving cycles is the emphasis on the development of shared expertise. Making use of the distributed expertise of the community members, the aim of this model is to support the collaboratively problem solving process resulting in a shared understanding.

The successive elements of progressive inquiry are:

- *Creating the context.* To be able to explore the problem more deeply, members have to get familiar with it. A context needs to be created to clarify why the issues in question are relevant and worthwhile to investigate (Hakkarainen, 1998). This way the community develops a body of understanding that serves as an anchor for the formulation of the problem statement or research question.

- *Setting up research questions.* The next step is to set up questions that guide the process of inquiry. Scientific inquiry can be seen as a problem solving process. Initial questions guide and direct the search for information.
- *Constructing working theories.* Once the community has agreed on an initial research question, the members are invited to construct their own interpretation. Construction of personal working theories guides the participants to use their background knowledge to offer an explanation for the problem. A first knowledge base of the communities understanding of the problem is being created.
- *Critical evaluation.* This knowledge base or inventory of distributed expertise needs to be evaluated. Critical evaluation is important to assess advances in the theories or explanations being offered. Through evaluating whether and how well the working theories explain the chosen problems, the community seeks to assess strengths and weaknesses of different explanations and identify contradictory explanations, gaps of knowledge.
- *Searching deepening knowledge.* Considerable advances of inquiry cannot be made without obtaining new information. By examining prior problem statements or working theories with the help of new information, the community may become aware of their inadequate presuppositions. New information may help them to reconstruct their conceptual understanding of the problem.
- *Engagement in deepening inquiry.* Progressive inquiry is a process of further refinement; at first the community has a broad conception of the problem that leads to general questions. After inventory of prior knowledge and searching for new information, more specific questions emerge. Advances in inquiry is captured by examining a chain of (deepening) questions.
- *Constructing new working theories.* By finding answers to subordinate questions, the community approaches step-by-step toward answering the initial question or problem statement.
- *Shared expertise.* All the above-mentioned elements of this model will be performed and shared by all the community members. Cognitive research indicates that advancement of inquiry can be substantially elicited by relying on socially distributed cognitive resources, and collaborative efforts to advance shared understanding and expertise (Hakkarainen, 1998)

3) Extending the audience

The third important function ICT can have is to extend the audience of the outcomes of learning. Learners do not only learn for themselves and their teachers but also for another audience. These can be other learners, parents, employers, or even a general audience. One important application is the use of competition. Prizes are given for the best design, the best inquiry or the best advice (Thinkquest, Grassroots). Another application is the use of real clients. Learner's activities have a role for real clients: they solve real problems, give real advice, make real products, do real research or construct new meaning for clients. Finally, using weblogs in education and training is another way to extend the audience for learning which is attracting attention of late.

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